

REMARKS/ARGUMENTS

Independent claims 1, 2, 5, and 7 have been amended to recite that a substrate assembly is provided that comprises a silicon substrate having at least one vertically extending segment and that a trench formed in the silicon substrate is filled with a dielectric material to form the oxide isolation region. Support for the amendments is found in the as-filed specification at at least paragraphs [022], [024], [046], [050], and [052]. No new matter has been added.

The Office Action mailed May 4, 2005, has been received and reviewed. Claims 1-7 are currently pending in the application. Claims 1-7 stand rejected. Applicants have amended claims 1, 2, 5, and 7, canceled claim 6, and respectfully request reconsideration of the application as amended herein.

Objection to Specification

As requested by the Examiner, the status information of the parent application has been updated in paragraph [001] of the specification.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 4,786,954 to Morie *et al.*

Claims 1, 2, and 4-7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,786,954 to Morie *et al.* ("Morie"). Applicants have canceled claim 6, rendering moot the rejection as to this claim. Applicants respectfully traverse the rejection as to the remaining claims, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Morie discloses a method of manufacturing a semiconductor memory device. Morie at column 1, lines 9-11. The semiconductor memory device is manufactured by forming a silicon oxide film by thermal oxidation on a p-type silicon substrate. *Id.* at column 5, lines 52-59. A silicon nitride film is formed on this silicon oxide film and another silicon oxide film is formed

on the silicon nitride film. *Id.* The silicon oxide films and the silicon nitride film are etched. *Id.* at column 5, lines 60-64. The p-type silicon substrate is then etched using the silicon oxide films and the silicon nitride film as a mask to form a trench. *Id.* at column 5, lines 65-68. The trench is doped with boron and the exposed silicon oxide film is removed. *Id.* at column 6, lines 3-11. Another silicon oxide film is formed on the inner surface of the trench. *Id.* at column 6, lines 11-14. The trench is filled with a photoresist layer, upon which a silicon oxide film is formed. *Id.* at column 6, lines 16-23. The exposed silicon oxide film and the photoresist layer are patterned to partially expose the silicon oxide film on the inner surface of the trench. *Id.* at column 6, lines 33-39. The exposed silicon oxide film on the inner surface of the trench is then etched to form a window in an upper portion of the trench. *Id.* at column 6, lines 42-45. A doped silicon film is then formed over portions of the silicon oxide film on the inner surface of the trench. *Id.* at column 6, lines 53-56.

Morie does not anticipate claim 1 because Morie does not expressly or inherently describe each and every element of claim 1. Specifically, Morie does not expressly or inherently describe the elements of “providing a substrate assembly comprising a silicon substrate having at least one vertically extending segment, wherein the at least one vertically extending segment is doped to form an active area” and “filling the trench with a dielectric material to form the oxide isolation region.” Morie does not disclose that its p-type silicon substrate has at least one vertically extending segment and, therefore, does not expressly or inherently describe this element of claim 1.

Morie also does not disclose that the trench is filled with a dielectric material to form the oxide isolation region. Rather, an inner surface of the trench in Morie is lined with silicon oxide, which is partially removed before a doped silicon film is formed over the remaining silicon oxide film. The Examiner states that Morie discloses “filling the trench with a dielectric material 40/18.” Office Action of May 4, 2005, p.3. However, material 18 in Morie is a photoresist film, not a dielectric material. Therefore, although the trench of Morie is filled with photoresist (as shown in FIG. 6E), the material is not a dielectric material. Furthermore, while material 40 is a dielectric material, this material is formed on the inner surface of the trench and, therefore, does not fill the trench.

Since Morie does not expressly or inherently describe each and every element of claim 1, the anticipation rejection is improper and should be withdrawn.

Since each of independent claims 2, 5, and 7 has been amended to recite substantially the same limitations as claim 1, claims 2, 5, and 7 are each allowable for substantially the same reasons as claim 1.

Claim 4 is allowable, *inter alia*, as depending from an allowable base claim.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Morie Taken with U.S. Patent No. 5,166,084 to Pfister

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Morie in view of U.S. Patent No. 5,166,084 to Pfister ("Pfister"). Applicants respectfully submit that dependent claim 3 is allowable, *inter alia*, as depending from an allowable base claim.

Double Patenting Rejection Based on U.S. Patent No. 6,168,986

Claims 1-7 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-52 of U.S. Patent No. 6,168,986. In order to avoid further expenses and time delay, Applicants elect to expedite the prosecution of the present application by filing a terminal disclaimer to obviate the double patenting rejections in compliance with 37 CFR §§1.321 (b) and (c). Applicants' filing of the terminal disclaimer should not be construed as acquiescence to the Examiner's double patenting or obviousness-type double patenting rejections. Attached are the terminal disclaimer and accompanying fee.

ENTRY OF AMENDMENTS

The amendments to claims 1, 2, 5, and 7 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

CONCLUSION

Claims 1-5 and 7 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain that might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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